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CARDIOVASCULAR FLASHLIGHT

doi:10.1093/eurheartj/ehu036
Online publish-ahead-of-print 16 February 2014

First three-dimensional optical frequency domain imaging evaluation of a bioabsorbable vascular scaffold implantation in an instent-restenosis 6 years after CYPHER stenting

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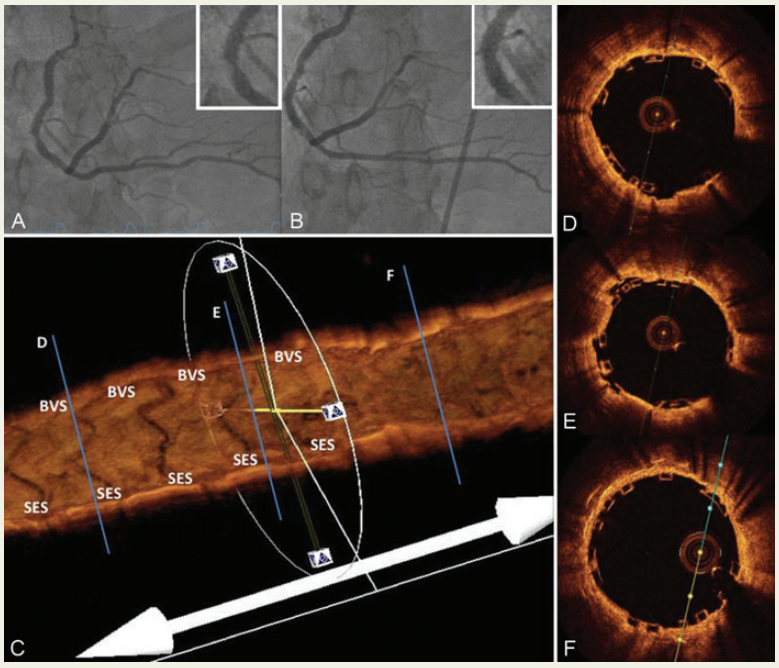

A 60-year-old male patient with a past history of acute ST-segment elevation myocardial infarction in 2007 and primary percutaneous coronary intervention of the right coronary artery (RCA) was referred to the Andreas Gruentzig Catheterization Laboratories for elective evaluation due to angina symptoms and a positive stress perfusion magnetic resonance imaging (MRI) with an inferoseptal ischaemic burden and furthermore a reduced left ventricular ejection fraction of 39% was detected by MRI. An angiogram was performed and as culprit lesion a 70% in-CYPHER-Stent restenosis in the middle portion of the RCA (*Panel A*) was detected. After passing the lesion with a BMW guide wire and a vascular sealing with a 3.0 × 15 mm Maverick balloon and a 3.0 × 12 mm non-compliant Maverick balloon (25 atmosphere), a bioabsorbable vascular scaffold (BVS) 3.5 × 18 mm was implanted in the middle portion of the RCA. Subsequently, after post-dilatation with a 3.5 × 15 mm non-compliant Maverick balloon (25 atmosphere), the final angiogram (*Panel B*) and three-dimensional (3D)-optical frequency domain imaging (OFDI) (*Panel C*) demonstrated an optimal post-procedural result with well-apposed scaffold struts in all cross-sectional images (*Panels D–F*).

Bioabsorbable vascular scaffold has been utilized to cover simple, *de novo* lesions so far. Scarce data exist on the potential use of BVS in off-label indications, such as acute coronary syndromes, in bifurcation lesions, chronic total occlusions and in-stent restenosis. Interventional studies are now underway to answer the safety issues of these indications.

Three-dimensional optical frequency domain imaging as a high-frame rate and high resolution intravascular imaging shows the strut apposition of implanted scaffolds inapparent in coronary angiography. Furthermore, the rapid spiral pullback enables the 3D reconstruction and visualization of the strut rupture and whole scaffold structure. Herein, we present for the first time a 3D-OFDI to demonstrate the performance and feasibility of BVS in a patient with in-stent restenosis.